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CONTRACTING ORGANIZATION: University of South Carolina
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14. ABSTRACT Does walking outdoors have the same breast cancer protective effect as walking on a treadmill indoors, away from natural light, in a typical gym atmosphere? Is the ambient exposure to sunlight important in stress and breast cancer risk reduction? Our basic premise is that the breast cancer protective mechanisms of exercise depend on context of exercise, not just on the number of repetitive muscular contractions completed over a specific period of time, and that a more pleasant and peaceful environment will decrease perceived stress and enhance immunity, theoretically leading to more positive mood and more effective cancer surveillance. A more relaxed walking atmosphere may decrease physiological consequences of stress, such as high cortisol, melatonin, and norepinephrine (as measured by alpha amylase). Revisions to the original endpoints include adding a questionnaire to assess mood changes, and replacing blood samples with salivary hormone measurements of cortisol, alpha amylase, and melatonin.					
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Introduction

Do the Effects of Exercise on Breast Cancer Prevention Vary With Environment?

Does walking outdoors have the same breast cancer protective effect as walking on a treadmill indoors, away from natural light, in a typical gym atmosphere? Is the ambient exposure to sunlight important in stress and breast cancer risk reduction? Our basic premise is that the breast cancer protective mechanisms of exercise depend on context of exercise, not just on the number of repetitive muscular contractions completed over a specific period of time, and that a more pleasant and peaceful environment will decrease perceived stress and enhance immunity, theoretically leading to more positive mood and more effective cancer surveillance. A more relaxed walking atmosphere may decrease physiological consequences of stress, such as high cortisol, melatonin, and norepinephrine (as measured by alpha amylase). Revisions to the original endpoints include adding a questionnaire to assess mood changes, and replacing blood samples with salivary hormone measurements of cortisol, alpha amylase, and melatonin.

Body of Report

Task 1. Develop Plan for Study Computer Database, Months 1-3

- a. **Normal study values will be entered for each outcome variable, so out-of-range values will immediately alert investigators to potential problems.**

Completed

- b. **Access database will be developed to monitor each volunteer and to record data from laboratory analyses and medical histories.**

Tracking system was in place. However, due to the resignation of the project coordinator only two days before the study began, after recruiting only 5 women, the study was then expanded to healthy postmenopausal women who normally exercised 3.5 hours/week. It was not possible to recruit 13 healthy postmenopausal women who had been treated for early breast cancer who normally exercised at least 3.5 hours/week. Our constraint was the South Carolina summer, which is hot and muggy, and the scheduled study day for the outside exercise was May 25th. Our additional constraint was the necessity of completing the study before October 17th, ruling out the possibility of postponing the study until the weather became cooler in the fall.

Task 2. Obtain IRB approval from local institutions (Palmetto Health Alliance and the University of South Carolina).

- a. Done

Task 3. Obtain IRB approval from the U.S. Army

- a. The re-designed endpoints were submitted to the Human Subjects Protection Specialist, and the changes were approved February 14, 2005 by my local IRB (University of South Carolina),

Task 4. Subject Recruitment and Study, Months 5-7

- a. Subjects were recruited primarily by the PI during the 2 days prior to the commencement of the study. This was the result of the unexpected resignation of the project manager, Wendy MacKenzie, 2 days before the commencement of the study.

Recruitment of healthy volunteers and selection of eligible subjects is estimated to take 3 months.

- a. A total of 26 healthy postmenopausal women were recruited. However, due to heavy rains on the afternoon of the first exercise session, 5 women did not come to the first session, and 2 others were determined to be premenopausal, rather than postmenopausal, and therefore were ineligible. A total of 19 healthy postmenopausal women participated in the study. There were no dropouts.

Task 5. Data Analysis of Results from Healthy Volunteers, Months 8-12

- a. Meetings with oncologists and member of the Exercise Sciences Department at the University of South Carolina to present preliminary data.**
 - 1. Meetings have taken place, but due to difficulties in the lab analysis of the saliva samples for melatonin, the final data were only available October 15, 2005. Meetings are ongoing and we hope to have the final manuscript submitted by the end of October, 2005.
- b. Final meeting with volunteers to explain study results and to answer any questions.**
 - 1. Meeting was scheduled for September, 2005, but we will wait until all analyses have been completed.
- c. Final report to USARMC**
 - 1. This is the Final report to USARMC.

Key Research Accomplishments

1. Completed the study.
2. Presented poster at the South Carolina Public Health Association Annual Meeting, May 25, 2005 at Springmaid Beach Conference Center, Myrtle Beach, SC
3. Poster accepted for the American Association of Cancer Researchers Frontiers in Cancer Prevention Research October 30 – November 2, 2005 in Baltimore, MD.
4. Submission of abstract to the American Society of Preventive Oncology Annual meeting February 26-28, 2006 in Bethesda, MD.
5. Final analyses and manuscript preparation continues.
6. Degrees obtained that were supported by this training grant:
 - Senthil Raghavan was supported by this grant for two years, and completed his Masters degree in Public Health.
 - Santosh Ghumare was partially supported by this grant during his classwork towards his Masters degree in Public Health.
7. Grant applications based on these results are in process.

Reportable Outcomes

1. Presented poster at the South Carolina Public Health Association Annual Meeting, May 25, 2005 at Springmaid Beach Conference Center, Myrtle Beach, SC
2. Poster accepted for the American Association of Cancer Researchers Frontiers in Cancer Prevention Research October 30 – November 2, 2005 in Baltimore, MD.
3. Submission of abstract to the American Society of Preventive Oncology Annual meeting February 26-28, 2006 in Bethesda, MD.

Conclusions

1. Although there was no change in acute stress (salivary alpha amylase) for women walking outdoors, there was a 36% increase for the women when they walked on treadmills ($p=0.033$) (comparison of pre versus post exercise indoors).
2. Chronic stress (cortisol) levels were also 25% higher for women after an hour of treadmill walking indoors than after an hour of walking outdoors ($p<0.027$) (post indoors vs post outdoors).
3. Treadmill walking was also associated with a 67% increase in anger assessment, compared to a 50% decrease in angry feelings after an hour of outdoor walking, as a result, the indoor anger post measurements were significantly higher ($p=0.037$) than the post measurements of anger outdoors (post indoors versus post outdoors). Both frustration and worry were also higher indoors ($p < 0.02$).
4. Positive emotions of feeling pleased, happy, delighted, and joyful were all higher after an hour of walking outdoors ($p<0.05$).

Our original hypothesis that the exercise environment is an important modulator of stress and mood responses is supported by our data. More research is needed in assessing what makes exercise pleasurable, as a pleasant experience would contribute to greater adherence to an exercise regime and to more favorable reduction in stress hormones.

References

1. Manuscript preparation is in progress.

List of Personnel

P.I.

Jane Teas, Ph.D.

Co-P.I.

Gregory Hand, Ph.D.

Project Director

Wendy MacKenzie

Medical Monitors

Gladys Gaillard-McBride, APRN

Renee I. L'Ecuyer, MSN, APRN, CFNP

Statistician

Daniela K. Nitcheva, Ph.D.

Appendices

1. Abstract for poster at the South Carolina Public Health Association Annual Meeting, May 25, 2005 at Springmaid Beach Conference Center, Myrtle Beach, SC
2. Abstract for poster accepted for the American Association of Cancer Researchers Frontiers in Cancer Prevention Research October 30 – November 2, 2005 in Baltimore, MD.
3. Abstract submitted to the American Society of Preventive Oncology Annual meeting February 26-28, 2006 in Bethesda, MD.
4. CV for Jane Teas, Ph.D.

Abstract for poster at the South Carolina Public Health Association Annual Meeting, May 25, 2005 at Springmaid Beach Conference Center, Myrtle Beach, SC

Do the Effects of Exercise on Breast Cancer Prevention Vary with Environment?

Jane Teas, Ph.D., Santosh Ghumare, B. A. M. S., Wendy McKenzie, B.S.

Studies of breast cancer risk and exercise have generally reported lower risk with regular exercise. The mechanisms of action are not well understood, and we propose that the specific environment in which exercise is done plays an important role in its anticarcinogenic effects. This could either be via a direct physiological response modification in stress hormones such as cortisol and norepinephrine and the anti-stress/antioxidant hormone melatonin, or indirectly via mood in which a pleasant exercise experience would lead to pleasure-associated improvements in immunity and greater adherence to an exercise regime. Little is known about the effects of exercise on healthy postmenopausal women. Most studies have focused on college students and elite athletes. In this study we examine the effects of exercise done either indoors in a university gym on a treadmill or outdoors, walking along a college campus. Twenty four postmenopausal women were recruited to walk for 1 hour at approximately 3 miles/hour rate first indoors and then outdoors. Half of the women had a history of having been treated for breast cancer. All women received brief physical exams before beginning exercise. Saliva samples and three brief qualitative stress questionnaires were used to estimate stress levels. Noise and light exposures in the two kinds of exercise environments were also measured as possible confounding variables. As the study is ongoing, results have not yet been analyzed, but will be available by the conference date. By describing exercise in different environments and its effects on different physiological systems, we will be able to make more precise on breast cancer risk reduction strategies.

**Abstract for poster accepted for the American Association of Cancer Researchers
Frontiers in Cancer Prevention Research October 30 – November 2, 2005 in
Baltimore, MD.**

Do the Effects of Exercise Vary with Environment?

Jane Teas, Mindy Holland, Santosh Ghumare, Daniela Nitcheva, Wesley Dudgeon, Kisito Ogoussan, Gregory Hand.

Most of the 57 epidemiologic reports comparing exercise with the risk of breast cancer have found that exercise reduces risk, with median risk reduction averaging about 20-30% for postmenopausal women. Of the 12 studies that did not show a reduction in risk, two found an increase, and 10 found no association. Recent evidence from breast cancer survivors in the Nurses Health Study indicates that exercise for 1 – 3 hours per week can decrease breast cancer recurrence by up to 50%. Several mechanisms have been proposed, including modulation of hormones, improved weight control, and possible changes in immunity. Methodological issues of concern have been accurate measurement of intensity, dose response, and amount of exercise. However, exercise is more than the repetitive contraction and relaxation of muscles. Most exercise physiology studies have focused on college students and elite athletes, and little is known about the effects of exercise on healthy postmenopausal women. We investigated the possibility that the environment in which the exercise takes place can impact physiological and psychological responses to exercise, and could be an important cofactor in explaining variation in the protective effects of exercise against breast cancer. **Methods:** 19 healthy postmenopausal women who normally exercised at least 3 hours/week were recruited for the study. We compared the effects of an hour of walking exercise done at a comfortable self-determined pace either indoors in a university gym on a treadmill, or outdoors, walking on the university campus. To simulate a normal gym atmosphere, we played similar heavy metal music at the same loudness in our gym lab as played in two other workout rooms in the same PE center. Mood changes were assessed by pre and post exercise questionnaires (Visual Analogue Scale-Anxiety, Visual Analogue Scale-Happiness, Positive Affect Scale and the Negative Affect Scale), blood pressure and pulse rate variations, and salivary hormone changes in chronic stress (salivary cortisol) and acute stress (norepinephrine, as indirectly measured by changes in salivary alpha amylase).

Results: Although there was no change in acute stress (salivary alpha amylase) for women walking outdoors, there was a 36% increase for the women when they walked on treadmills ($p=0.03$). Chronic stress (cortisol) levels were also 25% higher for women after an hour of treadmill walking indoors than after an hour of walking outdoors ($p=0.03$). Treadmill walking was also associated with a 66% increase in anger assessment, compared to a 50% decrease in angry feelings after an hour of outdoor walking. The differences in post exercise anger was significantly different ($p=0.01$). Eighteen of the women preferred walking outdoors along the wooded paths over walking on treadmills in a gym setting.

Conclusions: The exercise environment can be a significant factor in the stress response to exercise. More research is needed in assessing what makes exercise pleasurable, as a pleasant experience would contribute to greater adherence to an exercise regime and to more favorable reduction in stress hormones.

Abstract submitted to the American Society of Preventive Oncology Annual meeting
February 26-28, 2006 in Bethesda, MD.

Stress hormones, mood, and exercise

Teas J, Holland M, Nitcheva D, Ghumare S, Ogooussan K, Dudgeon W, Hand G.

Exercise physiology studies have focused primarily on individuals under the age of 50 years, and little is known about the effects of exercise on healthy postmenopausal women. In this study we compared the effects on both stress hormones and mood changes associated with walking for an hour outdoors and indoors.

Methods: 19 healthy postmenopausal women who normally exercised at least 3 hours/week were recruited for the study. We compared the effects of an hour of walking exercise done at a comfortable self-determined pace either indoors in a university gym on a treadmill, or outdoors, walking on the university campus. To simulate a normal gym atmosphere, we played similar heavy metal music at the same loudness as music played in two public workout rooms in the same exercise facility.

Mood changes were assessed by questionnaires and salivary hormone changes in chronic stress (salivary cortisol) and acute stress (norepinephrine, as indirectly measured by changes in salivary alpha amylase).

Results: Subjects reported improved mood (pleased, delighted, happy, and joyful) after walking in both environments. However treadmill walking for an hour was associated with a 67% increase in self-reported anger, compared to a 50% decrease in angry feelings after an hour of outdoor walking ($p=0.037$). Stress hormone responses varied with environment. Alpha amylase was unchanged for women walking outdoors, but 42% higher for the women after walking on a treadmill ($p=0.057$). Cortisol levels were also 25% higher for women after an hour of treadmill walking indoors compared to outdoor walking ($p<0.027$).

Conclusions: The exercise environment can be a significant factor in mood and stress hormone responses to exercise and these changes may contribute to understanding how exercise reduces cancer risk.

Funded by the Department of Defense Concept Award A100751

CURRICULUM VITAE OF JANE TEAS

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FAX: (803) 734-5505

Home Address

6049 Robinwood Rd
Columbia, SC 29206

TEL: (803) 738-3129

Academic Training

Postdoctoral Research Fellow

Harvard School of Public Health
Boston, MA

1978-1983

Department: Interdisciplinary Programs in Health. Special Projects in Breast Cancer Epidemiology, Animal Models of Carcinogenesis (Seaweed), AIDS, and Anthropological Research in Medical Decision Making.

Ph.D.

Johns Hopkins University
School of Hygiene and Public Health
Baltimore, MD

1978

Major Field: Pathobiology. Minors: Ecology and Parasitology.
Dissertation title: Behavioral Ecology of Rhesus Monkeys in Kathmandu, Nepal

B.A.

University of California
Berkeley, CA

1973

Major Fields: Anthropology and Geography

Academic Positions:

Research Assistant Professor
present

1999-

University of South Carolina, Department of Environmental Health
Sciences

And the South Carolina Cancer Center

Continue to research health effects of brown seaweed against both cancer (breast, colon, and prostate), and HIV.

Studied macrobiotics and cancer and faith and healing for a CDC funded grant on Complementary and Alternative Medicine with Curative Intent

Member: South Carolina Cancer Center, South Carolina Cancer Alliance; University of South Carolina

Member: Women's Studies Affiliate Board 1999-2003

Member: African Studies Working Group 2004

Member: American Anthropology Association

Member: American Association for Cancer Research

Research Assistant Professor

1990-1999

University of Massachusetts Medical School, Department of Medicine, Division of Preventive and Behavioral Medicine, Worcester, MA

Wrote numerous grants, three of which have been funded to study brown seaweeds and breast cancer prevention. Taught graduate course in Medical Anthropology

Lecturer

1990-1991

University of Massachusetts, Department of Anthropology. Boston, MA

Taught two-semester undergraduate course in primate behavior.

Research Associate

1984-1985

Harvard University, Department of Anthropology, Cambridge, MA

Infant Care Project. Analyzed data collected on breastfeeding and non-breastfeeding mothers living in the Boston area, co-authored papers, and supervised two research assistants.

Grants Awarded:

University of South Carolina Education Foundation and personal E-Funds at the Department of Health Promotion, Education and Behavior

2/03-open

Algae and AIDS

Purpose: To explore the possibility that dietary algae could prolong symptom-free survival and reduce HIV viral load for HIV positive patients

Role: PI

University of South Carolina Office of Research

7/04-7/06

**Part of the Center for Cancer Complementary and Alternative Medicine (CCCCAM)
at the University of South Carolina**

Dietary algae in poor prognosis breast cancer

Purpose: To explore the consequences of dietary algae on cell-cell adhesion.

Role: PI

**Department of Defense / Phase VI Medical University of South Carolina and
University of South Carolina** **2/04 – 1/06**

Dietary Algae as a Modulator of Breast Cancer Metastases.

Purpose: To explore validate methods for detecting metastatic breast cancer cells in peripheral blood and to evaluate whether dietary seaweed has an effect on breast cancer cell numbers and CXCR4/SDF-1 binding

Role: PI

Department of Defense BC996167/DAMD-17-00-1-0659 **10/17/05**

Do the Effects of Exercise on Breast Cancer Prevention Vary with Environment?

Purpose: To investigate whether the effects of exercise vary with the specific environment (indoors versus outdoors).

Role: PI

Centers for Disease Control SIP6 U48/CCU409664 **10/1/2000-9/30/2004**

Complementary and Alternative Medicine with Curative Intent

Purpose: To investigate the use and efficacy of faith healing and macrobiotics as complementary and alternative medicine as it is currently being used in the Columbia, South Carolina area.

Role: PI

Department of Defense DAMD17-98-1-8207 **3/31/98 - 5/31/2005**

Dietary Seaweed and Soy and Early Breast Cancer: A Randomized Trial

Purpose: The major goal of this study is to compare the effects of dietary seaweed and soy to placebo. We are collecting data on biomarkers of breast cancer risk.

Role: PI

The South Carolina Cancer Center **July 1, 2000 - June 30, 2001**

Ratio of Two Urinary Estrogen Metabolites and Risk of Prostate Cancer

Purpose: To determine if estrogen metabolism is correlated with PSA levels and prostate cancer in men.

Role: PI

Centers for Disease Control **October, 2000 - September, 2004**
Complementary and Alternative Medicine with Curative Intent

Purpose: To investigate faith healing practices in Columbia, SC, and to document the use of macrobiotics in the treatment of cancer.

Role: PI

Palmetto Health Foundation

October 2000 - September 2003

Pilot Study of HBO Treatment to Reduce Breast Cancer Treatment Related Lymphedema

Purpose: To evaluate the effectiveness of hyperbaric oxygen therapy on breast cancer treatment related lymphedema.

Role: PI

Susan G. Komen Foundation

1998-2000

Brown Seaweed as a Breast Cancer Preventive

Purpose: Evaluate the health effects of chronic seaweed ingestion in healthy postmenopausal women.

Role: PI

Earthwatch

1984

Rhesus Maternal Care and Demography. Kathmandu, Nepal

Purpose: Collect primate behavioral data.

Role: PI

Wallace Genetic Foundation

1982

Seaweed and Breast Cancer

Purpose: Pilot study to explore the effects of dietary seaweed in a rat Dimethylbenzanthracene (DMBA) mammary carcinogen model

Role: PI

Earthwatch

1978

Male Behavior of Rhesus Kathmandu, Nepal

Purpose: Collect primate behavioral data on non-troop males and their social behavior.

Role: PI

Earthwatch

1977

Rhesus Troop Home Range Behavior

Purpose: Collect information on the home range behavior of two troops of monkeys living in temples in Kathmandu, Nepal.

Role: PI

National Geographic Society

1974-1978

Temple Monkeys of Kathmandu Nepal

Purpose: Collect information on monkeys living in two temples in Kathmandu Nepal

Role: Project Leader

Publications

Teas J, Patterson K, Royer J. Could Dietary Algae protect against HIV Progression? **HIV Nutrition Update** February 15, 2005

Teas J, Pino S, Critchley A, Braverman LE. Variability of iodine content in common commercially available edible seaweeds. **Thyroid** 2004;14(10) 836-841.

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Macrobiotics and cancer: Interviews with practitioners and their impressions of efficacy of macrobiotics for healing from cancer. **Cancer Epidemiology Biomarkers & Prevention** 11(10):D136 Part 2 Oct 2002

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staff of the Kunde Hospital, Nepal, 1966-1972. **Department of Local Development/UNICEF Research cum Action Project Paper No. 1.** Kathmandu, Nepal. 1973.

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Book Chapters

J. Helen Fitton, **Jane Teas**. Marine algae and polysaccharides with therapeutic applications. In **Marine Nutraceuticals**, Ed Colin Barrow. CRC Press. In Press.

Teas J. **Dietary Brown Seaweeds and Human Health Effects**
Seaweed Resources Ed: Critchley, Alan T, Masao Ohno and Danilo Largo
Expert Centre for Taxonomic Identification, Univ. Amsterdam. In Press.

Book Submitted:

Jane Teas, Mindy Holland. **Faith that Heals.** Submitted to First Edition Press.

Papers Submitted:

Teas J, Braverman LE, Kurzer MS, Pino S, Hurley TG, Hebert JR. Seaweed and Soy: Companion Foods in Asian Cuisine and Their Effects on Thyroid Function in American Women

Heiney SP, McWayne J, **Teas J**. Being Real on Holy Ground: The Lived Experience of Hospital Chaplains

Papers Presented

Teas J Dietary Seaweeds and Breast Cancer. **British Phycology Society** Lancaster, England January 2004.

Teas J. HIV and Edible Algae: Preliminary Findings. **XVIII International Seaweed Symposium.** Bergen, Norway June 2004.

Teas J. Macrobiotics and Peace. **American Anthropology Association.** Chicago IL. November 21, 2003.

Teas J. Macrobiotics for Cancer: Theory and Practice. **Society of Applied Anthropology.** Portland Oregon. March 19-23, 2003.

Teas J. The Cultural Construction of Seaweed: From Slime to the Macrobiotic Sublime. **Society for Applied Anthropology.** Atlanta GA. March 6-10, 2002.

Teas J. "Healing among the faithful" **University of South Carolina Medical Humanities Lunch Seminar,** October 30, 2002.

Teas J. Heiney SP, Cousins A, and Khushf G, with P. Verma, C.P. Kanwat, G. Jackson and V. Moore. "Concepts of Healing Among Doctors and Patients." **The Carolinas Medical Humanities Group.** College of Charleston. Saturday, September 21, 2002.

Teas J. Health Effects of Seaweed. **International Macrobiotic Summer Conference.** Allardsoog-Holland. July 14-20, 2001.

Teas J. Faith and Healing: Overview of a new study at USC. **Alpha Xi Chapter of the Sigma Theta Tau International Honor Society of Nursing.** Columbia, SC Feb 23, 2001.

Teas J. A Review of Iodine and Arsenic in Dietary Seaweeds. **Kushi Institute Summer Conference** 2000.

Kushi LH, Akbar CR, Hebert JR, Lerman RH, Lerner A, Pollack S, Potter JD, **Teas J.**, Gallagher M, Kushi M. Study of the Macrobiotic approach to cancer: A best case series. **American Public Health Association.** 124th Annual Meeting, New York, NY. Nov 17-21, 1996.

Posters Presented

Teas J. Dietary Algae and Breast Cancer. Hollings Cancer Center MUSC 5th Annual Research Retreat Citadel's Holliday Alumni Center, November 18, 2005

Teas J., Holland M, Ghumare S, Nitcheva D, Ogooussan K, Dudgeon W, Hand G. Do the Effects of Exercise Vary with Environment? Fourth Annual **AACR International Conference on Frontiers in Cancer Prevention Research** Baltimore Convention Center, October 30-November 2, 2005.

Teas J. Ph.D., Fitton HJ, Ph.D., Irhimeh M, M.S., Ghumare S, BOMB³, Talwani R, M.D.⁴, Phillips KD, Ph.D.⁵, Hand G, Ph.D.³, Dudgeon W, M.S.³, Daniels D, M.D., Randolph LJ, M.D., Belay A, Ph.D. Dietary Algae as Modulator of CD4 Cell Counts in

People with HIV. **3rd Annual SC Nutrition Research Summit** on Friday, November 4, 2005 Columbia Conference Center, Columbia SC.

Teas, J., Holland, M., Ghumare, S Do the Effects of Exercise on Breast Cancer Prevention Vary with Environment? **South Carolina Public Health Association** May 25, 2005 Myrtle Beach , SC.

Ghumare, S., Teas, J. AIDS Epidemic in India - Exploring New Alternatives **SCPHA** May 25, 2005 Myrtle Beach , SC.

J Teas, Ghumare S, Talwani R, Fitton JH, Belay A, Irhimeh M
Eat Algae to Slow down HIV? A Pilot Study and Economic Feasibility Case Study in India. **2nd Annual SC Nutrition Research Summit.** October 29, 2004 Columbia, SC.

Teas J, Pino S, Hurley TG, Critchley A, Braverman LE. Effect of Seaweed Ingestion on Thyroid Function in Postmenopausal Women P3-675 **Endocrinology Society Annual Meeting**, Philadelphia, PN June 2003.

Vitoc C, Cunningham J, Heiney SP, **Teas J**, Jansen K, Gregory L. A survey of lymphedema among breast cancer survivors: Preliminary results. **Hollings Cancer Center MUSC 3rd Annual Research Retreat**, Isle of Palms, SC Dec 5, 2003

Teas J, Cousins A, Heiney SP, Verma P, Kanwat CP, Jackson TG, Moore V. Healing Imagery Among Charismatic Christians in South Carolina. **International Center for the Integration of Health and Spirituality (ICIHS)** Integrating Research on Spirituality and Health and Well-Being Into Service Delivery: A Research Conference April 1-3, 2003, National Institutes of Health Campus, Bethesda, Maryland

Heiney SP, McWayne J, **Teas J**. Holy Ground: A phenomenological study of hospital chaplains. **International Center for the Integration of Health and Spirituality (ICIHS)** Integrating Research on Spirituality and Health and Well-Being Into Service Delivery: A Research Conference April 1-3, 2003, National Institutes of Health Campus Bethesda, Maryland

Teas J, Raghavan S, Nitcheva D, Lamb L, Meeh P, Bopp C, Thompson R, Zhang Q, Reisman D, Zimba P, Carraway R, Davis JM, Muga S, Kanwat CP, Durstine JL. Can Eating Seaweed Make a High Fat Fast Food Breakfast Healthier? **First Annual SC Nutrition Research Consortium**, October 17, 2003. Irmo, SC

Harmon B, MS, RD; **Teas J**, PhD; Hebert JR, ScD; Hurley T, Ehlers M. A Comparison of typical Macrobiotic Diets to the Dietary Reference Intakes - Preliminary Results. **First Annual SC Nutrition Research Consortium**, October 17, 2003. Irmo, SC

Raghavan R, **Teas J**, Cunningham J, Cone L, Jansen K, Nitcheva D, Xie D, Deng, Z, Butler W. Can Hyperbaric Oxygen Therapy Reduce Breast Cancer Treatment-Related

Lymphedema? **Hollings Cancer Center MUSC 3rd Annual Research Retreat**, Isle of Palms, SC Dec 5, 2003.

J Teas, JE Cunningham, G Rice, S Rice, P Verma, CP Kanwat, J Whetstone, J Hebert, A Kushi, T Leatherman, A Cousins, LH Kushi. Macrobiotics and Cancer: Interviews with Macrobiotic Practitioners. **American Association of Cancer Research International Conference on Frontiers in Cancer Prevention Research**. Boston MA. October 14-18, 2002.

AL Cousins, G Jackson, S Heiney, P Verma, CP Kanwat, JE Cunningham, G Khushf, **J Teas**. Faith and Healing among Christians in South Carolina. Spirituality & Healing in Medicine. **Harvard Medical School and The Mind/Body Medical Institute**. Boston MA. Dec 15-17, 2001.

AL Cousins, S Heiney, P Verma, JE Cunningham, G Khushf, **J Teas**. Data in search of analysis: How can we understand patient narratives that attribute healing to faith? **Alpha Xi Chapter of the Sigma Theta Tau International Honor Society of Nursing**. Columbia, SC February 2001.

Teas J, Pino S, Cunningham J, Hurley T, Critchley A, Braverman L. Iodine in Dietary Seaweeds: Range of Values and Possible Concerns. **XVIIth International Seaweed Symposium**. Cape Town South Africa. Jan 28-Feb 2, 2001.

Cunningham J, Cousins A, **Teas J** & Kushi. L. Macrobiotics for Health, Healing and Cancer Prevention: Progress Report. **American Institute for Cancer Research**. Washington DC. July 16-17, 2001.

Cunningham J, **Teas J**, Jack A, Cousins A, and Kushi L. Macrobiotics and Cancer. **Royal Society of Chemistry Biologically Active Phytochemicals in Foods**. Norwich, UK. Sept.26-28, 2001.

Teas, J., Cunningham, J.E. and Braverman, .Dietary Seaweed and Soy and Early Breast Cancer: A Randomized Trial. Era of Hope **Department of Defense** Conference Proceedings, June 8-11, 2000

Reviewer for:

Journal of Nutrition
International Immunopharmacology
Journal of Pharmacy and Pharmacology.
Molecular and Cellular Biochemistry
Clinical and Experimental Pharmacology and Physiology

Review Committees

1996-1999 University of Massachusetts IRB

1998 University of Massachusetts Internal Grant Review
2004 University of South Carolina Research Centers of Economic Excellence Review

Conferences Organized

Epidemics: Past, Present, and Future. The Carolinas Medical Humanities Group. Spring Meeting (Local arrangements in Columbia): The University of South Carolina, Columbia. Saturday March 29, 2003.

Other Activities

Expert testimony given to FTC in support of SeaVegg
South Carolina Science Fair Judge 2000-present
Breast cancer telephone support group invited guest speaker

Government Testimony

Expert testimony to the United States Food and Drug Administration on behalf of SeaVegg. May, 2005.

Comments to the United States Food and Drug Administration on merits of Fucus weight loss patches. December, 2004.

Comments in support of the Macrobiotics Best Case Series made to the Cancer Advisory Panel for Complementary Medicine (CAPCAM) February 25, 2002. Democracy Plaza, Bethesda, Maryland.
<http://nccam.nih.gov/about/advisory/capcam/minutes/2002feb.htm#6>

Patent Application

University of South Carolina Patent Office
USCRF No. 380.01b-PPA (**Teas**)
Algae and AIDS (PPA)
Provisional Patent Application
May 4, 2005

Work Experience

Principal Investigator

Seaweed Studies (Komen and Army):

Collected 22 samples of edible seaweed for iodine determination, identified seaweed harvesters, visited harvest sites, chose site and harvester, identified encapsulator, visited site, directed patient recruitment, organized sample container identification system, labeled containers, performed basic laboratory sample preparation of urine and blood specimens,

Supervised Project Director who coordinated volunteer enrollment and participation, identified new research questions and arranged for additional analyses.
Processed blood and urine samples, developed labeling and storage systems; developed collaborative relationships with investigators in 7 labs;
Data analysis and interpretation; Writing articles on results.

Department of Defense Studies (breast cancer and seaweed; exercise)

Wrote IRB applications and have worked with the Army IRB to try to achieve permission to conduct the studies
Conducted preliminary flow cytometry studies, interpreted data, wrote follow-up grants

Complementary and Alternative Medicine Studies

Wrote IRB applications
Supervised project coordinator, 4 students, worked with colleagues, hired professionals,
Conducted fieldwork on faith institutions
Conducted interviews
Writing and data interpretation
Directed project
Copy-edited 2,780 pages of transcripts that were then given to the Smithsonian Museum of American History permanent research collection December 28, 2004

Earthwatch and National Geographic

Designed and directed various primate research projects, trained 60 volunteers in behavioral methodologies, coordinated the on-site data collection and analysis in Kathmandu, Nepal, worked with primatology colleagues, analyzed data, interpreted data, wrote papers

Principal U.S. Department of Defense 1998-present

Investigator **IDEA Award**

Principal investigator for a project involving dose-response relationship of brown seaweeds and breast cancer prevention. Identified seaweeds to be used, visited harvesters. Recruitment will begin during the summer of 1999.

Member Multicultural Committee 1993-99
Touchstone Community School
Grafton, MA

Active member of Multicultural Committee that seeks to provide diversity to the students at Touchstone Community School. Classroom speaker on primate behavior and culture and people of Nepal.

Member Human Subjects Committee 1992-1995
University of Massachusetts
Medical School

Worcester, MA

Member of the internal review board that reviews all scientific proposals for issues that relate to safety of human volunteers.

Chairperson Ways and Means, Welcome Wagon 1992
Shrewsbury, MA

Organized fundraising activities for charitable organization of women in Shrewsbury.
Responsible for raising the most money in the organization's history.

President Tobin Hill, Inc 1987-1991

Co-created a company to produce and sell seaweed-based moisturizer. Co-designed product, identified chemist and seaweed ingredients, co-designed label, wrote bylaws, filed incorporation paperwork, co-wrote advertising, co-designed business plan, co-designed packaging, identified packaging company, did order fulfillment, oversaw mail order advertising, kept accounts, and filed taxes and filed un-incorporation paperwork.

President Human Ecology Associates 1986-1987
Dorchester, MA

Organized and moderated one-day workshops for New England Interstate Water Pollution control commission on Pesticides and Drinking Water. Edited newsletter on "Potatoes, Pesticides, and Problems" workshop, wrote newsletter on "Lawncare"; Organized and provided logistical support for two day workshop on Contaminated fish and Shellfish; wrote final summary of workshop for EPA Region I.

Organized and conducted field research on possible animal vectors of AIDS. Identified hogs living in the Belle Glade, Florida AIDS epicenter, coordinated collection of hog blood and delivery of the blood to Pirbright Labs in England. Collected ticks from houses and nearby areas to the Belle Glade epicenter. Arranged for the ticks to be tested for AIDS transmission.

Consultant UNICEF 1987

Kampala, Uganda

Designed and wrote a grant to the World Health Organization for \$20,000,000 for the UNICEF AIDS public health program in Uganda.

Toxics Coordinator New England Interstate 1985-1986
Water Pollution Control
Commission

And

Northeast States for Coordinated

Air Use Management

Boston, MA

Coordinated interstate workgroups on aquatic toxicity, pesticides, drinking water, and health, and air toxics for the six New England states, New York, and New Jersey. Edited regional air toxics risk assessments for tetrachloroethylene and trichloroethylene.

Principal Investigator	Earthwatch/Center for Field Research Belmont, MA	Summers of 1977, 1978, and 1984
Medical Writer	"New York Native"	1984-1991

Summarized information on AIDS for a general audience. The "New York Native" was a gay newspaper in New York City. My particular focus was on African Swine Fever Virus and AIDS.

Principal Investigator	Wallace Genetic Foundation	1982
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Designed and conducted an animal study to test the protective effects of dietary seaweed against chemically induced mammary carcinogenesis; coordinated the efforts of a veterinarian and a biostatistician and provided animal care during the project.

Consultant	John Snow Inc 210 Lincoln St.	1981, 1982 and 1983
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Boston, MA 02111

Provided an annotated bibliography of available research relating to traditional medical practices and health attitudes of people in Nepal, and the status of women in Nepal; designed two goiter intervention programs for a health project in Nepal.

Collaborator	Legal Medicine Harvard School of Public Health 665 Huntington Ave Boston, MA 02115	1982
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Interviewed doctors, nurses, data managers, and hospital administrators about perceived problems with informed consent procedures for cancer patients.